



**Institut für Mathematik
und Wissenschaftliches Rechnen
Karl-Franzens-Universität Graz**



EINLADUNG

zum Vortrag von

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Titel: Mathematical Models for Spatially Heterogeneous Biofilm-Communities.

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Abstract:

Biofilms are dense aggregations of microbial cells encased in a slimy extracellular matrix that form on surfaces in moist environments. They play an important role in various natural and industrial systems.

We address deterministic continuum models for the growth of spatially heterogeneous biofilm communities formulated as quasilinear reaction diffusion systems. A prototype biofilm growth model is discussed as well as multi-species extensions that take further biofilm processes into account.

While the dissolved substrates satisfy classical semilinear reaction-diffusion equations, the governing equations for the biomass exhibit two non-linear diffusion effects: a power-law degeneracy (like the porous medium equation) and super diffusion. The existence and uniqueness of solutions is shown and numerical simulations presented to illustrate the model behavior.

This is joint work with H. J. Eberl (University of Guelph, Canada) and M. A. Efendiev (Helmholtz Center Munich, Germany).

Prof. Klemens Fellner